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EBASCO SERVICES INCORPORATED

PROJECT MANAGEMENT PLAN
FOR
NEW BEDFORD HARBOR
MASSACHUSETTS

AUGUST 1986

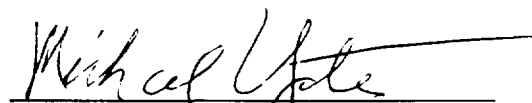
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GLOSSARY OF TERMS

1.0 DESCRIPTION OF THE PROJECT

1.1 STATEMENT OF OBJECTIVES

The objective of the New Bedford Harbor Project is to select, design and construct a remedial action alternative which will protect the public health, public welfare and the environment. More specifically, the remedial action alternative objectives are to:

- a. "clean up" the site in a timely manner;
- b. meet FDA-established maximum contaminant levels for PCBs in fish and shellfish in the site area, to permit reopening of waters to fishing;
- c. support enforcement action, as needed;
- d. meet the current requirements of CERCLA and the National Contingency Plan;
- e. comply with other applicable EPA directives.

1.2 DESCRIPTION OF THE SITE

New Bedford Harbor, a tidal estuary, is situated between the City of New Bedford on the west and the towns of Fairhaven and Acushnet on the east at the head of Buzzards Bay, Massachusetts. The site can be divided for administrative purposes into four geographic areas as shown in the attached Exhibit 1-1. The most northern portion of the site extends from the Coggeshall Street Bridge north to Wood Street in Acushnet. The remainder of the site extends south from the Coggeshall Street Bridge through the New Bedford Hurricane Barrier and into Buzzards Bay as far as the southern limit of PCB Closure Zone 3. Geographic boundaries include the shoreline, wetlands and peripheral upland areas.

The New Bedford Wastewater Treatment Plant, the combined sewer system outfalls, the Aerovox plant and the Cornell-Dubilier plant, all documented discharge points of PCBs, are within the areas of concern for the site. The New Bedford and Sullivan's Ledge Landfills are repositories of PCBs. Their relationship to the Harbor site is discussed in Sections 1.2.2 and 1.3 which follow.

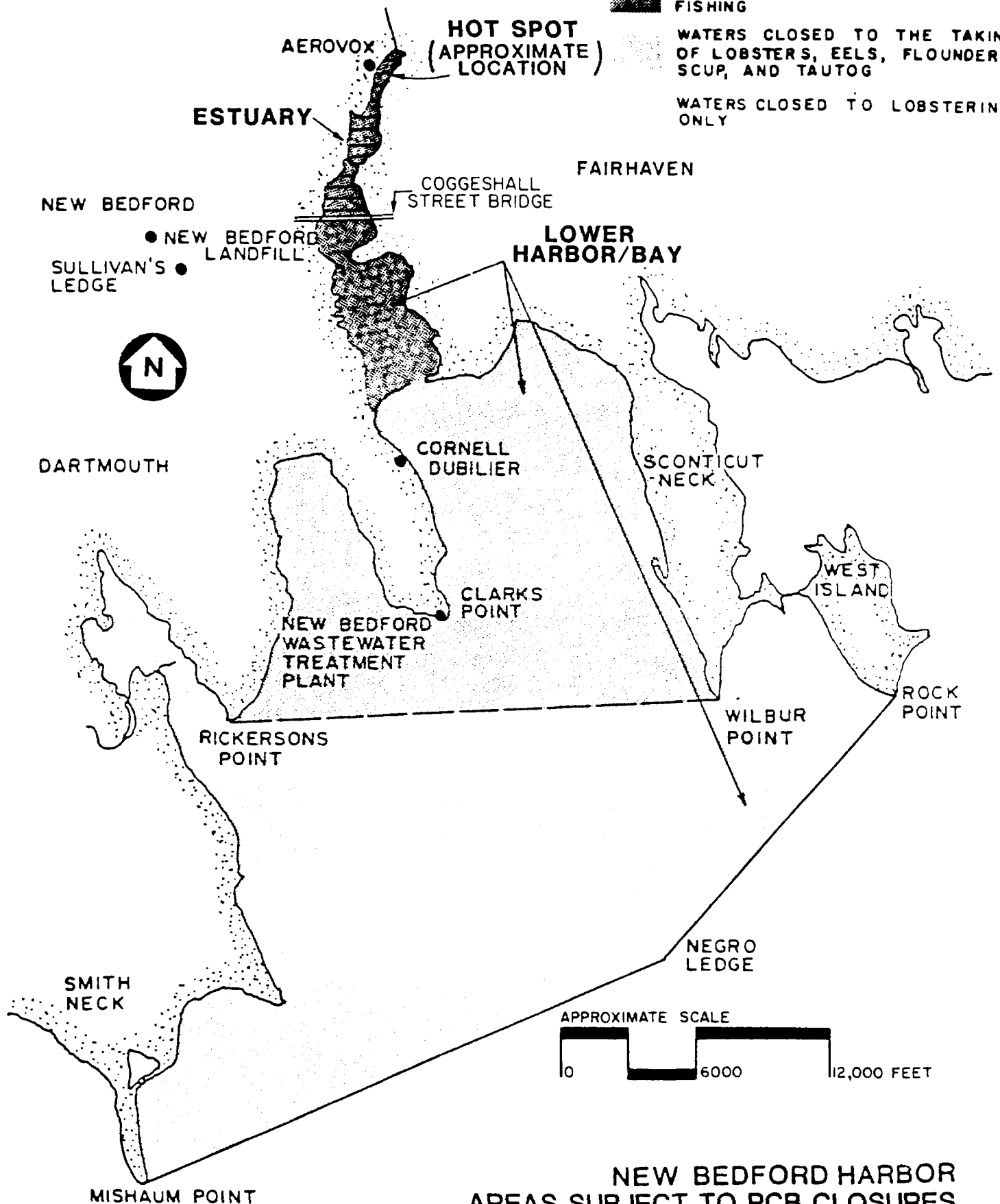
AREAS SUBJECT TO PCB CLOSURES



WATERS CLOSED TO ALL FISHING

WATERS CLOSED TO THE TAKING OF LOBSTERS, EELS, FLOUNDERS, SCUP, AND TAUTOG

WATERS CLOSED TO LOBSTERING ONLY



NEW BEDFORD HARBOR
AREAS SUBJECT TO PCB CLOSURES

EXHIBIT 1-1

1.2.1 History of the Site

As early as 1974 environmental sampling by the New England Aquarium documented the presence of PCBs in New Bedford Harbor and Buzzards Bay. Between 1974 and July 1982, when New Bedford Harbor was placed on the Interim National Priorities List (see 1.2.2) a number of environmental studies were conducted which provided additional information on PCBs in New Bedford Harbor. Following the NPL listing, EPA Region I initiated a comprehensive assessment of the PCB problem in the New Bedford area in August 1982. The assessment included sampling at the New Bedford Landfill and Sullivan's Ledge Landfill, an area-wide ambient air monitoring program, a sediment PCB profile for the Acushnet River and the Harbor, biota sampling in the estuary, harbor and bay and a study of sewer system contamination. The results of this assessment were presented in a Remedial Action Master Plan (RAMP) for the Site in May 1983. The plan included recommendations for studies to further delineate the contamination problems.

Concurrent with the assessment leading to the RAMP, EPA compiled a data base on the sampling and analytical results of previous studies in the New Bedford Harbor and Buzzards Bay area. The final report on this data collection effort was issued by EPA in August 1983.

The RAMP report, data report and their supporting studies provided the basis for EPA to allocate \$3.4 million for remedial investigations and feasibility studies for New Bedford in August 1983.

In August 1983, NUS Corporation (NUS) began preparing a Work Plan which included plans for a fast track Feasibility Study of remedial action alternatives for the highly-contaminated mudflats and sediments of the Acushnet River Estuary, north of the Coggeshall Street Bridge. This fast-track study was requested by the EPA and the Commonwealth of Massachusetts, since the extremely high levels of PCBs and heavy metals in these locations appeared to pose an immediate risk to public health, public welfare, and the environment. In October 1983, NUS received interim authorization to proceed with the comprehensive work plan.

Upon completion of this Feasibility Study in August 1984, EPA sought public review and comment on five cleanup options for the Upper Estuary (Acushnet River).

The options were:

- o Channeling the Acushnet River north of the Coggeshall Street Bridge and capping contaminated sediments in the remaining open water areas.
- o Dredging contaminated sediments and disposing of them in a partially lined containment site in the northern part of the estuary, along the eastern shore.
- o Same option as above, except that the containment site would be lined on the bottom, as well as on the sides.
- o Dredging contaminated sediments and disposing of them in a nearby upland containment site (no site presently available).
- o Dredging contaminated sediments (which lay over clean sediments) and dredging clean sediments, temporarily storing both before returning the contaminated sediments to the bottom and covering with clean sediments.

EPA received extensive comments on the options from other federal, state and local officials, potentially responsible parties, and individuals. Many of these comments expressed concern regarding the adequacy of available dredging techniques and the potential impacts of dredging on the Harbor due to re-suspension of contaminated sediments. The potential release of contaminated water ("leachate") from an unlined disposal site was another area of concern.

In attempting to respond to these comments, the Agency decided it would be necessary to conduct additional studies before choosing a cleanup method for the Upper Estuary. The bulk of the proposed additional studies, which will be compiled into an Upper Estuary Feasibility Study (FS), is an in-depth study of the feasibility of dredging and disposal. EPA asked dredging and disposal experts from the U.S. Army, Corps of Engineers (USACE) to design and carry out these studies.

The Corps of Engineers' study is not repeating work done in EPA's and NUS' previous studies; instead, it will provide more detailed information specific to New Bedford Harbor sediments on the feasibility and potential impacts of dredging and disposal.

The FS will also evaluate in more detail the potential environmental impacts from the proposed cleanup options.

The FS involves performing laboratory studies on a composite of individual sediment samples from the Upper Estuary. While collecting samples in the estuary near the Aerovox property it was noted that the sediment appeared to be anomolous and contained more oily substance than at other locations. Laboratory analyses have indicated that sediments within one grid contain PCBs at concentrations above 30,000 ppm, an order of magnitude greater than the concentrations in other sediment samples.

As a result, this area has been termed the "hot spot" in the Upper Estuary. It will be evaluated separately in the overall Harbor/Bay RI/FS Work Plan.

In addition to the Acushnet River FS, EPA is conducting studies to evaluate the extent of the PCB and other contamination throughout the overall Harbor/Bay. Concurrent with these studies EPA is evaluating cleanup options for the overall Harbor/Bay.

Enforcement actions are also underway. In December 1983 the National Oceanic and Atmospheric Administration (NOAA) filed the original legal suit under CERCLA for natural resources damages. The suit has been amended to add EPA as a plaintiff and to add other PRP's as defendants. Additionally, the scope of the suit was expanded to include cost recovery. NOAA is currently assessing natural resource damages for losses of fisheries resources and related public welfare losses.

The Center for Disease Control (CDC) is conducting a study of PCB concentrations in blood and urine of 1400 citizens in the New Bedford Harbor vicinity. The study has scheduled interviews, lab analyses and data evaluation to be completed by May 1986. Analyses will be performed in June and July 1986 and the study report published in the Fall 1986. Based upon the results, a Phase II study may be undertaken to re-sample approximately 150 individuals with greater the 30ppb PCB in their blood.

1.2.2 National Priorities Site Listing (NPL)

At the present time the New Bedford Harbor Site is listed on the NPL in Group 2 as Site Number 76. The site was proposed for listing on June 29, 1982 as the top priority site designated by the State of Massachusetts. Massachusetts did so because the site was not prioritized by the initial numerical ranking. As a result, the site was placed on the Interim Priority List of sites on July 23, 1982.

The site, as listed, included the Upper Estuary Acushnet River, New Bedford Harbor, Buzzards Bay as far as the third shellfish closure line, Sullivan's Ledge Landfill, the New Bedford Landfill, the New Bedford Treatment plant and sewers, biota and the ambient air.

Sullivan's Ledge Landfill was listed as a separate NPL site in September 1983. The site position on the list is in Group 10, Number 463. A separate RI/FS is being performed on this site and is not part of this effort.

The disposition of PCBs in the New Bedford Treatment Plant and sewer system is being addressed by two means. Cornell-Dubilier completed a sewer line cleanup in the vicinity of their property in the Fall 1984. The City of New Bedford has applied to EPA for a waiver from secondary Treatment for the Clark's Point Treatment Plant under Section 301 (h) of the Clean Water Act, as amended. Region I's Water Management Division is currently in the process of reviewing this waiver application and assessing the impacts of PCBs and metals discharged in the wastewater from the existing treatment process. A pretreatment program has been approved by EPA and is being carried out by the City of New Bedford.

Ambient air and biota are being addressed in the remedial investigation as pathways for migration and receptors of PCBs, respectively.

The New Bedford Landfill will be evaluated and ranked to determine if it qualifies for listing as a separate NPL Site. This will be done by evaluating the work completed to date and conducting a preliminary assessment and site inspection (PA/SI) to provide information for the ranking process.

The remedial action decisions for Sullivan's Ledge Landfill and possibly the New Bedford Landfill will be made through independent remedial investigation and feasibility studies. Decisions on the landfills will not impact the remedial action selection for the New Bedford Harbor site.

Major events which led to the State's designating New Bedford as the top priority site were:

- 1974 New England Aquarium report documents the presence of low level PCB contamination throughout Buzzards Bay.
- 1976 EPA sampling of Aerovox, Cornell-Dubilier and the New Bedford Wastewater Treatment Plant reveal significant levels of PCBs in the industrial and municipal discharges. High levels of PCBs are also found in harbor sediments and marine life.

- 1976 EPA publishes report titled "New England PCB Waste Management Study". Aerovox and Cornell-Dubilier were identified as users of PCBs and the New Bedford Municipal landfill was documented as a disposal location.
- 1977 Massachusetts Department of Public Health (DPH) issues warnings that lobsters and bottom feeding finfish from a defined area in Buzzards Bay should not be consumed, after learning they contain PCBs in concentrations exceeding 5 ppm.
- 1978 U.S. EPA Region I prepares a summary report of all PCB data in New England titled, "Polychlorinated Biphenyls in New England".
- 1978 U.S. EPA study titled "Environmental Assessment of Polychlorinated Biphenyls (PCBs) Near New Bedford, Massachusetts, Municipal Landfill" concludes that atmospheric release of PCBs from the landfill is most likely the principal mode of their escape. Sampling conducted during the summer of 1977 finds atmospheric PCB levels in excess of 1 microgram per m3, the NIOSH recommended eight hour exposure limit.
- 1979 Massachusetts Department of Public Health exercises its legal authority to close areas of Buzzards Bay to the taking of lobsters, finfish and shellfish because of PCB contamination.
- 1980 DEQE and EPA designate the New Bedford Harbor PCB problem as a priority issue in the 1980 State - EPA agreement.
- 1981 Secretary Bewick of the Massachusetts Executive Office of Environmental Affairs establishes a PCB task force. DEQE chairs committee and holds monthly meetings to coordinate activities.
- 1981 Initial ranking of site by DEQE in July did not, result in the site being prioritized.
- 1982 In June, Massachusetts designates New Bedford as its top priority site.
- 1982 In July, EPA places New Bedford on Interim Priority List of 160 sites.

1984 Date of Promulgation as final NPL listing was September 21, 1984.

1.3 DESCRIPTION OF THE PROBLEM

Selecting and implementing the cost effective remedial action for New Bedford Harbor requires that the nature and extent of contamination by PCBs and metals be determined and that environmental effects, including impacts on public health, be evaluated. Conducting a RI/FS to select the remedial action currently involves five federal agencies or departments and six private consultants or institutions.

The following subsections contain discussions of the environmental problem being addressed and the management needs for successful implementation of the project.

1.3.1 The Environmental Problem

PCB contamination in New Bedford was first documented by both academic researchers and the Federal Government between the years 1974-1976. The Environmental Protection Agency (EPA) conducted a New England-wide PCB survey and found high levels of the chemical in various harbor locations. Testing revealed that Aerovox and Cornell-Dubilier were discharging wastewaters containing PCBs to New Bedford Harbor by both direct discharge and indirectly via the New Bedford municipal wastewater treatment facility.

Since this initial survey of the New Bedford area, a much better understanding of the extent of PCB contamination has been gained. The entire area north of the Hurricane Barrier, an area of 985 acres, is underlain by sediments containing elevated levels of PCBs and heavy metals. PCB concentrations range from a few parts per million (ppm) to over 30,000 ppm. Portions of western Buzzards Bay sediments are also contaminated, with concentrations occasionally exceeding 50 ppm. The water column in New Bedford Harbor has been measured to contain PCBs in the parts per billion range well in excess of EPA's "1 part per trillion" guideline. Much of the PCB sampling done before 1980 was analyzed for only one PCB isomer, Aroclor 1254. Woods Hole Oceanographic Institution scientists have presented evidence suggesting that, as a result, the PCB contamination is often understated by factors of three to five. Sampling and analyses performed since 1980 have included additional PCB isomers. Sediment copper concentrations were reported in 1977 to range

from more than 6,000 ppm near the head of the harbor, to less than 100 ppm at the edge of Buzzards Bay. Other metals are also present at lower concentrations. The direct discharge of PCB-contaminated wastewater from Cornell-Dubilier and Aerovox plants has been significantly reduced, as a result of EPA's amendments to their wastewater discharge permits. However, uncontrolled releases from the tidal mudflats beneath Aerovox's discharge have continued unabated. Studies have shown that 200 to 700 pounds of PCBs were previously discharged per year to Buzzards Bay via the Clark's Point outfall. The magnitude of the PCB discharge from the sewer system and treatment plant is being addressed by EPA in its review of New Bedford's application for a waiver from secondary treatment under Section 301 (h) of the Clean Water Act, as amended.

In addition to the immediate harbor and vicinity, the Sullivan's Ledge Landfill and the New Bedford Landfill have been studied to determine if they contain PCBs and other substances which may cause environmental problems. Sullivan's Ledge has been designated as a separate NPL site and is not included in the New Bedford Project.

The New Bedford Landfill will be evaluated and ranked under the NPL site listing process to determine if an investigation and feasibility study is necessary.

In addition to these known PCB disposal sites EPA has investigated a number of other potential sources and disposal sites. Of thirty areas investigated initially, five or fewer sites appear to warrant further investigation. These sites are being addressed by EPA's pre-remedial program.

The environmental impacts at the New Bedford Harbor site due to PCB and heavy metal contamination include both human health and effects on fishing in the area.

The most probable link of PCBs to human intake is the consumption of contaminated fish and shellfish from the Acushnet River Estuary. Widespread contamination of the Acushnet River Estuary environs has resulted in the accumulation of PCBs in many marine species. Although thousands of acres have been closed to the harvesting of shellfish, finfish, and lobsters, residents are known to still harvest both finfish and shellfish, thus exposing themselves to ingestion of PCBs. In addition, many individuals regularly consumed contaminated fish before the extent of environmental contamination by PCBs was known. The chronic toxicity effects on these people have not been evaluated.

The closure of the harbor and sections of Buzzards Bay to fishing has resulted in an estimated capital loss of \$250,000 per year to the lobster industry alone. Shellfish and finfish industries, as well as recreational fishing, have also suffered.

Exhibit 1-1 shows the three closure areas established by the Massachusetts Department of Public Health on September 25, 1979. Area 1 (New Bedford Harbor) is closed to the taking of all finfish, shellfish, and lobsters. Area 2 is closed to the taking of lobster and bottom-feeding fish (eels, scup, flounder, and tautog). Area 3 is closed to the taking of lobster. Responsibility for enforcement of these closures is entrusted to the Massachusetts Office of Environmental Affairs Division of Law Enforcement.

Contaminated sediments have also affected proposed harbor development projects, most of which require dredging. Dredging in New Bedford Harbor is restricted by the difficulties encountered in fulfilling State and Federal regulatory requirements for the disposal of contaminated dredge spoils.

1.3.2 The Management Needs

The New Bedford Harbor Project is a complex project. Seven federal agencies and departments, and seven state agencies, departments and offices have regulatory or review responsibility in the remedial action selection process, or related activities.

At the present time there are six private contractors and institutions and four federal agencies conducting engineering and scientific studies. Over fifty major tasks will be performed during the next 36 months. Estimated costs for these tasks are over \$5 million and seventy thousand hours of labor.

Management of the organizations and resources employed on this project to accomplish the objectives, on schedule and within budget, requires the use of proven procedures and systems. Effective tracking and reporting systems are particularly important in this regard, and must provide the Project Manager with information on potential delays and unanticipated problems on a timely basis so corrective or responsive action can be taken. In addition, it is necessary to have procedures for review of technical work.

These areas are discussed in detail in the following sections.

2.0 PROJECT SCHEDULE, TASKS, AND BUDGET

2.1 OVERALL SCHEDULE

Exhibit 2-1 is the Summary Schedule (Level 1) of the New Bedford Harbor Project showing the major groupings of tasks. The timeframe starts at March 1, 1986 and extends through March 1990 for completion of remedial contractor mobilization. For those tasks which are not underway the timeframes are preliminary. The assumptions that this schedule is based upon are given in Exhibit 2-2.

Exhibit 2-1 shows the major groups of project tasks through the remedial contractor mobilization task. More detail is shown for the Feasibility Study (FS) tasks because these are of immediate concern; as the project progresses more detail will be presented on post FS tasks.

A Level 2 New Bedford Project Schedule has been developed, which includes all tasks and some of the most significant activities. Exhibit 2-3 lists the major milestones in the Project Schedule. The Project Schedule will be updated as new tasks and activities are defined. More detailed task descriptions will be developed concurrently, as part of a Level 3 detailed project schedule which will provide the Project Manager with the level of detail required for project management.

Within the FS portion of the schedule, the length and uncertainty of certain tasks result in two critical paths. Presently underway are the laboratory and environmental analyses of the Upper Estuary composite sample, for dredging feasibility evaluations by the Corps of Engineers, and the laboratory analyses of the Harbor and Bay samples, for the PCB transport and food-chain models by NUS. Their rate of progress will be tracked as critical tasks.

Major tasks and activities are discussed in the following Section 2.2.

NEW BEDFORD HARBOR DRAFT SUMMARY SCHEDULE (LEVEL 1)

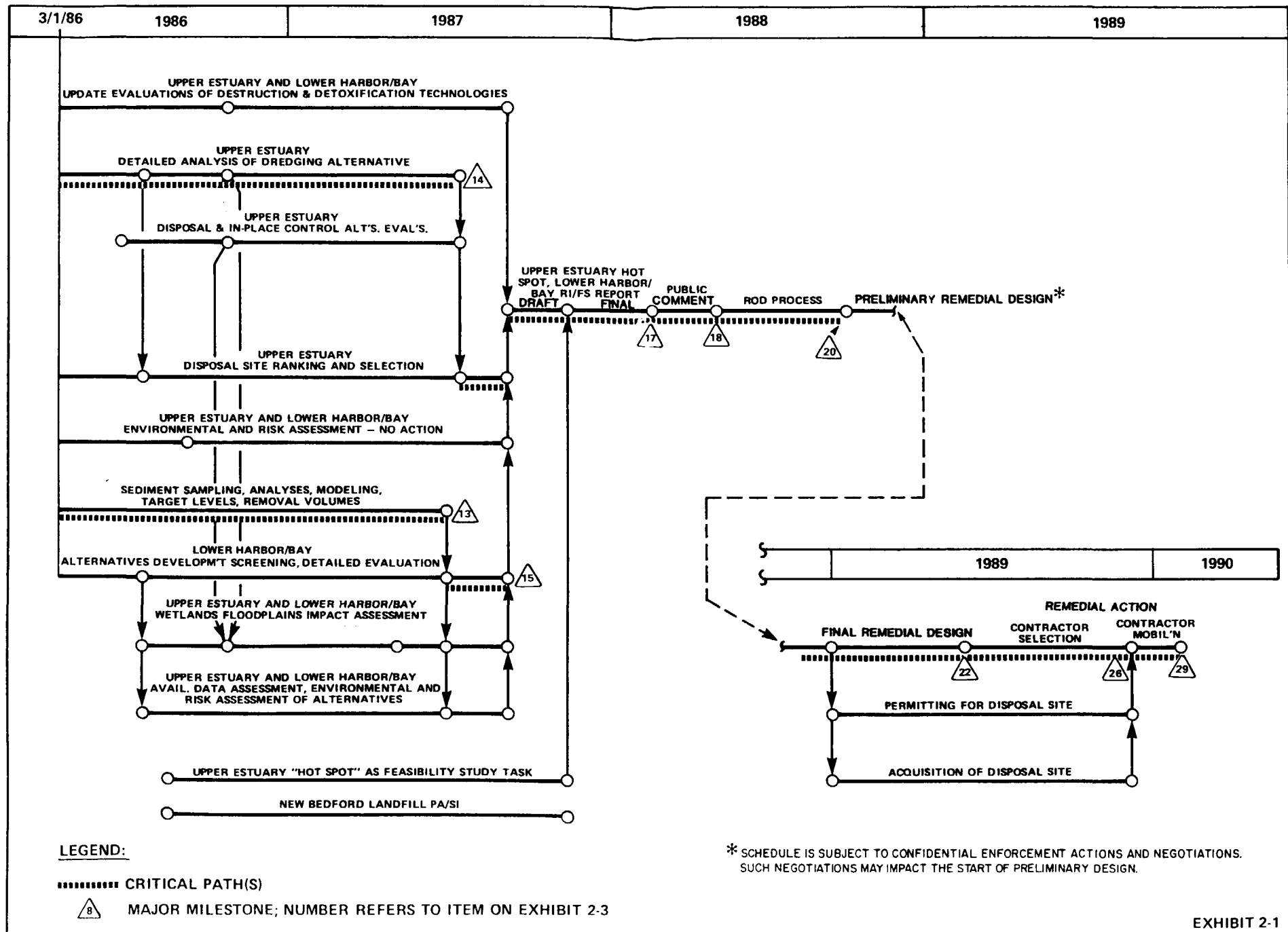


EXHIBIT 2-2

NEW BEDFORD HARBOR

RI/FS

OVERALL HARBOR PROJECT SCHEDULE

ASSUMPTIONS

1. CERCLA will be reauthorized at a time which will allow all RI/FS tasks (which start in or continue through fiscal year 1986) to be funded as of July 1, 1986.
2. The state of Massachusetts will participate in the RI/FS process as required to provide timely information on state requirements, policies, procedures, funding, recommendations and approvals.
3. The Remedial Investigation (RI) results will be comprised of several final technical reports completed by the USACE and EPA's contractors. EPA will designate those documents which will comprise the RI.
4. There will be one Feasibility Study Report, with separate sections, for the Upper Estuary, Lower Harbor/Bay, and the Upper Estuary "Hot Spot", if that area is to be evaluated as a separate area.
5. The Record of Decision will be signed in EPA headquarters.
6. Review periods for Agencies for reports and design documents will be one month.
7. All work completed to date is of sufficient technical quality and has been completed in accordance with NCP procedural requirements such that a Record of Decision can be completed without repeating activities or tasks.
8. Durations of all unassigned tasks are preliminary.

EXHIBIT 2-2

9. Existing data is sufficient to complete required environmental assessments of alternative remedial actions.
10. Dredging feasibility studies for the Upper Estuary will provide sufficient information to determine dredging feasibility for the Lower Harbor/Bay.
11. The area of highest concentrations of PCBs in the Upper Estuary offshore of Aerovox will be handled and treated as a separate piece of the overall project.
12. The ongoing enforcement action will not mandate project schedule changes.
13. The New Bedford Project will continue as a CERCLA financed cleanup.

Closely related to these assumptions are a number of issues which will be addressed as tasks in the RI/FS process or will be addressed outside of the process. The issues and how they will be addressed follow:

Addressed as Tasks

Technical Issues

- Task 05 Definition of clean-up levels for PCBs in sediments for the Lower Harbor/Bay.
- Tasks 11 through 18 Determination of the feasibility of dredging to remove PCBs in sediments.
- Task 23 Address how to handle the 3.6% PCB area adjacent to Aerovox.
- Task 24 Determination of the applicability of the results from Corps of Engineers studies to the Lower Harbor/Bay RI/FS.

EXHIBIT 2-2

Task 19 Determination of the disposal site options for harbor and upland locations; decision on necessity for the site to be lined.

Task 62 Overall validity of all RI/FS supporting data.

Procedural Issues

Task 80 Disposition of the New Bedford Landfill.

Task 19 Use of generic or specific upland disposal site for an upland disposal alternative.

Outside RI/FS Process

CDC Blood Study Relationship to RI/FS decisions.

Incorporation of NOAA Natural Resources Studies in RI/FS.

Management of Enforcement Case support

Exhibit 2-3

NEW BEDFORD HARBOR

MAJOR MILESTONES

<u>MILESTONE</u>	<u>SCHEDULED DATE</u>
1. EPA Approval of Rationale for Preparation of Upper Harbor Composite Sample.	March 1, 1986
2. Corps Completion of Composite Sample Collection and Shipment to Waterways Experiment Station.	April 1, 1986
3. Completion of PCB and Metals Analyses of All Enviromental Samples for Data Input to Hydroqual Food Chain Model.	July 30, 1986
4. Completion of Physical Sediment Analyses for Overall Harbor.	September 30, 1986
5. Decision on Similarity of Upper Harbor Sediments.	September 30, 1986
6. Completion of Review of Comments on 1984 Feasibility Study and Identification of Data and Information Gaps.	January 12, 1987
7. Completion of Leachate Prediction Tests.	January 14, 1987
8. Complete Calibration of PCB Transport Model.	January 25, 1987

Exhibit 2-3

<u>MILESTONE</u>	<u>SCHEDULED DATE</u>
9. Complete Calibration of Food Chain Model.	May 12, 1987
10. Complete Application of PCB Transport Model.	June 25, 1987
11. Complete Application of Food Chain Model.	July 11, 1987
12. Completion of Dredged Water Treatment Studies.	July 11, 1987
13. Determine PCB target Levels in Sediments and Lower Harbor/Bay Sediment Volumes for Removal.	September 9, 1987
14. Decision on Cost-effectiveness of Dredging for Upper Harbor.	September 9, 1987
15. Completion of Report on Final Evaluation of Remedial Alternatives.	November 8, 1987
16. Completion of EPA and State Review of Final Alternatives Report.	January 7, 1988
17. Completion of Final RI/FS Report.	March 7, 1988
18. Close of Public Comment Period.	May 6, 1988
19. Completion of Responsiveness Summary.	July 5, 1988
20. Completion of Record of Decision.	October 3, 1988

Exhibit 2-3

<u>MILESTONE</u>	<u>SCHEDULED DATE</u>
21. Re-evaluation of Project Schedule, Management Plan and Charter for Transition to USACE Technical Lead on Remedial Design.	November 2, 1988
22. Completion of Site Characterization and Preliminary Remedial Design.	March 1, 1989
23. Completion of Final Remedial Design and Review.	May 15, 1989
24. Complete Bid Package.	June 14, 1989
25. Issue Advance Notice to Bidders.	September 13, 1989
26. Complete Contractor Selection.	November 13, 1989
27. Acquire All Necessary Permits.	November 13, 1989
28. Acquire All Necessary Property.	November 13, 1989
29. Complete Mobilization.	January 12, 1990

2.2 PROJECT TASKS

The New Bedford Project includes seven major groups of tasks, as shown in Exhibit 2-4. The groups and associated Task Numbers are:

Tasks 01-09 o Remedial Investigation;
Tasks 10-29 o Feasibility Studies;
Tasks 30-39 o Remedial Design;
Tasks 40-49 o Remedial Action Construction;
Tasks 50-59 o Project Management;
Tasks 60-69 o Other Support;
Tasks 80-81 o Other Sources and Sites Investigations.

Brief descriptions of each task follow.

2.2.1 Remedial Investigation

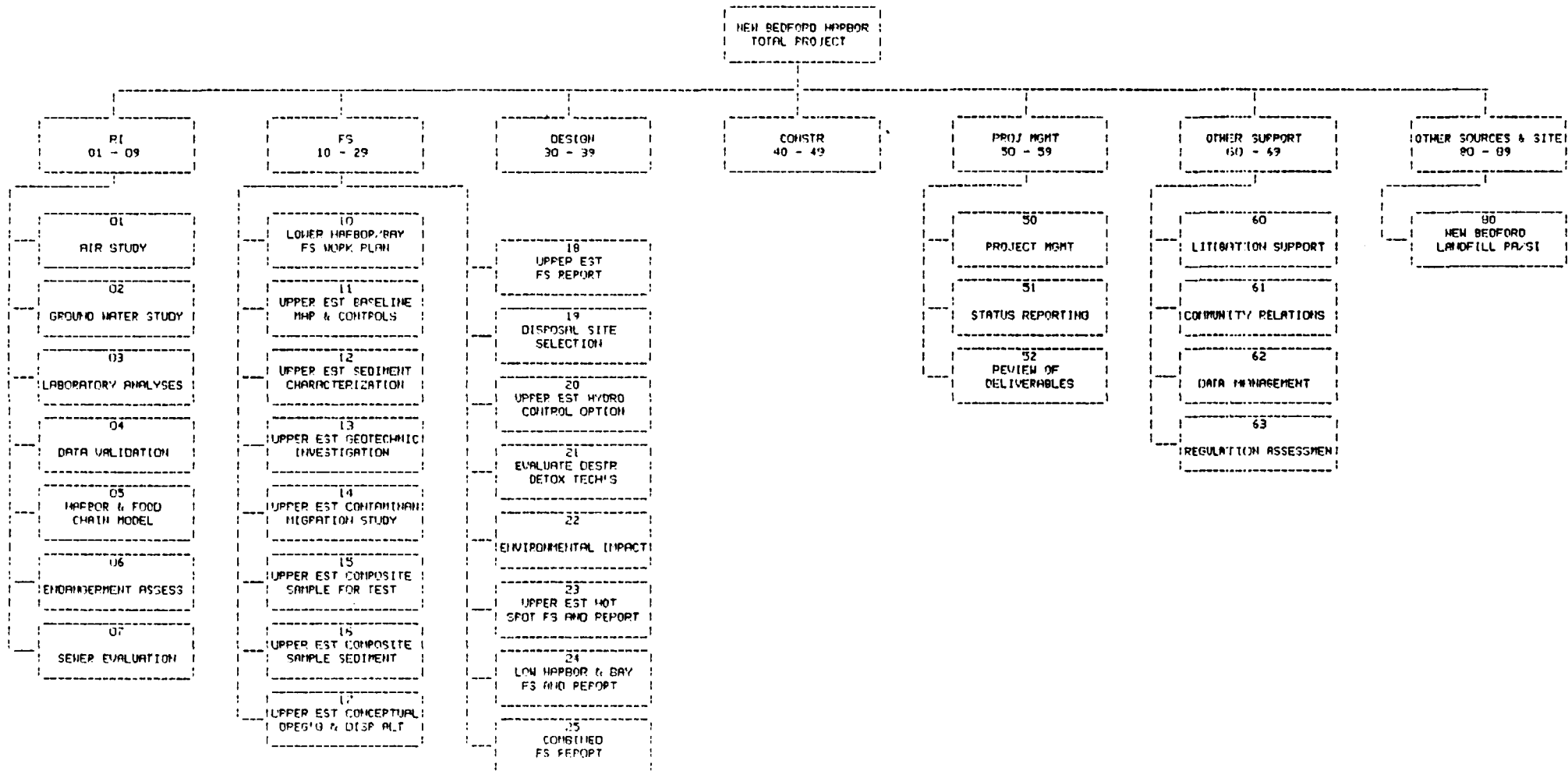
Task 01 (NUS Task 12) Air Studies - NUS has conducted ambient air sampling for PCBs in the vicinity of the Upper Estuary. This is to determine if the PCBs in sediments are being emitted to the ambient air. Sampling results will be utilized in evaluating potential exposures to PCBs in ambient air under the endangerment assessment tasks. Study results will be available in June 1986.

Task 02 (NUS Task 13) Groundwater Study - NUS has conducted studies to evaluate if PCBs have entered the groundwater beneath the Project site. The study results were submitted to EPA in February 1986.

Task 03 (NUS Tasks 23,24) Data/Analyses - Within the Lower Harbor and Bay sediment samples have been collected to evaluate the PCB content. In addition to PCB content NUS is analyzing the samples for various physical properties and the EPA Hazardous Substance List elements and compounds. this information will be utilized to determine comparability with Upper Estuary sediments and if elements and compounds other than PCBs are of concern.

Task 04 (NUS Task 5): Data Validation - Data validation is currently being conducted for RI/FS samples collected by the Corps of Engineers (Upper Estuary), NUS-GCA (Lower Harbor), and NUS-Battelle (Lower Harbor).

EXHIBIT 2-4
NEW BEDFORD PROJECT
WORK BREAKDOWN STRUCTURE



Task 05 (NUS Tasks 5,8,19): Hydrodynamic and Food Chain Modeling - Battelle (Hydrodynamic) and Hydroqual (Food Chain) are currently working on the development, calibration and verification of models to assess the distribution, transport and fate of PCBs in the upper Estuary and Lower Harbor. These models will be used to evaluate the effects of remedial action alternatives on PCB levels and distribution.

Task 06: Endangerment Assessment - An endangerment assessment of the no action alternative for the Upper Estuary, Harbor and portions of Buzzards Bay will be conducted by GCA. This work will entail assessing the potential and hazard for human populations to be exposed to PCBs and characterizing the subsequent risk to human health and an assessment of environmental endangment.

2.2.2 Feasibility Studies

Task 10 Feasibility Study (FS) Work Plan - This task involves preparation of a work plan to complete tasks which are unassigned at the present time and to combine the past and ongoing feasibility study work into one complete study and report for the Upper Estuary, Lower Harbor and Bay.

Task 11 (USACE Task 1) Upper Estuary FS Baseline Map and Controls - This is to establish positions and control for sediment sampling in the Upper Estuary to determine bottom contours and to conduct a topographic survey of the selected disposal area once the location is selected.

Task 12 (USACE Task 2) Upper Estuary Sediment Characterization - Sediment samples collected at locations established in Task 11 will be analyzed for PCB content. A subset of samples will be analyzed for EPA Hazardous Substance List compounds. In addition to chemical analyses, physical testing of sediments will also be done. Analytical results will be utilized in contaminant release studies, dredging controls, sediment migration analyses, liner evaluation studies, treatment studies and dredging and disposal evaluations.

Task 13 (USACE Task 3) Upper Estuary Geotechnical Investigations - These field investigations and analyses including seismic surveys, coring and observation wells will be conducted to define the subsurface characteristics to evaluate sites for confined aquatic disposal, and a confined spoil area in the estuary.

Task 14 (USACE Task 4) Upper Estuary Contaminant Migration - This task involves collection of field data to set up and calibrate a hydraulic model of the Upper Estuary. The model will be used to evaluate sediment movement within and beyond the Upper Estuary under present conditions and during dredging. These evaluations will provide information on controls needed during dredging.

Tasks 15 (USACE Task 5) Preparation of Composite Sample - Individual sediment samples from the Upper Estuary will be composited to provide one representative sample for testing under Task 16. The Waterways Experiment Station (WES) has developed a procedure for sample compositing based upon physical and chemical characteristics of the sediments. The sample was delivered to WES in April 1986.

Task 16 (USACE Task 6) Composite Sediment Sample Testing - The sample prepared under Task 15 will be tested in the laboratory to select a proper disposal alternative. The tests will evaluate water quality from disposal, disposal site surface runoff quality, disposal site leachate, capping requirements, physical properties after disposal, liner needs and disposal effluent treatment needs.

Task 17 (USACE Task 7 and NUS Task 16D) Conceptual Dredging and Disposal Alternatives and Sediment Containment Structure Evaluation - This task includes formulation of one or more alternative methods for dredging to remove PCBs in the Upper Estuary, evaluation of using a constructed dike near the Coggeshall Street Bridge to contain sediment during dredging and determining disposal site needs. The dredging and disposal site work will be done by USACE and the sediment containment evaluation by NUS.

Task 18 (USACE Task 8) Draft and Final Reports Upper Estuary Dredging Feasibility Studies - The USACE will prepare a draft and final report describing all the results of its study program.

Task 19 (NUS Task 6) Disposal Site Selection - This task involves updating past disposal site studies. It entails ranking sites and selecting alternative locations for disposal of sediments removed from the Upper Estuary and Lower Harbor/Bay. Both upland and Harbor shoreline sites will be considered. Siting reports will be circulated for review and comments by the public.

Task 20 (NUS Task 16B) Upper Estuary Hydraulic Control Option - In the Draft FS completed by NUS in 1984 one of the remedial action alternatives for the Upper Estuary involved constructing a permanent channel for the Acushnet River and capping sediments outside the channel limits. This task involves further evaluation of that alternative, including conceptual design and estimated costs.

Task 21 (NUS Task 16C) Evaluation of Destruction and Detoxification Technologies - In addition to disposal of sediments containing PCBs in a confined disposal area, methods to stabilize, detoxify and incinerate PCBs in sediments have been evaluated. This task is to update the current understanding and potential applicability of technology in this area to be utilized in developing final alternatives for remedial action.

Task 22 (NUS Tasks 22 and 26) Environmental Impacts Evaluations of Alternatives - The Remedial action alternative study process includes evaluating the environmental impacts of the alternatives. Impacts to be evaluated include changes in flood levels, effects on wetlands and effects on biota.

Task 23 Upper Estuary Hot Spot Feasibility Study - In the course of developing a composite sample preparation approach for the Upper Estuary it was determined that an area of sediments near Aerovox contain PCBs at concentrations far above the remainder of the Estuary. This area has been termed the "Hot Spot" and will be evaluated and treated separately.

Task 24 (NUS Tasks 16 A, 21) Lower Harbor/Bay Feasibility Study Draft and Final Reports - This task is preparation of a report on the feasibility studies for the Lower Harbor/Bay in draft and final form. In addition it includes activities which are part of the feasibility study process, such as selection of final upland and out of state disposal sites, review of public comments on the 1984 Draft FS Report, screening, selection and field evaluation of optional Lower Harbor/Bay disposal sites and risk assessments for the remedial action alternatives undergoing detailed evaluation.

Task 25 Feasibility Study Report - This task is to assemble in one document the feasibility studies of the Upper Estuary Hot Spot, the Upper Estuary and the Lower Harbor/Bay. The Feasibility Study Report will be supported by the Remedial Investigation (RI). The RI will be comprised of a series of reports designated as such by EPA.

2.2.3 Remedial Design

Tasks in this group will include site characterization, preliminary and final design, preparation of drawings and specifications, bidding, contractor selection, disposal site permitting and acquisition. The scope of these tasks will be developed when the Record of Decision process selects the remedial action to be implemented.

2.2.4 Remedial Action

This group of tasks will include contractor mobilization, construction, and construction monitoring.

2.2.5 Project Management

Task 50 (NUS Task 18, USACE Task 9) Project Management - This task includes the overall New Bedford project management and project management performed by USACE, NUS, GCA and Ebasco in managing the work to complete tasks they are conducting.

Task 51 Preparation of Status Reports - Under this task Ebasco will provide bi-weekly and monthly project status reports, beginning in March 1986. Monthly reports will contain information on status, resources, progress achieved, and the comparisons to planned schedule and budget at that point in time. Bi-weekly reports will contain information on schedule status and upcoming milestones.

Task 52 Review of Deliverables - Deliverables from ongoing tasks being performed by the USACE NUS and GCA will be reviewed by Ebasco for consistency with overall project objectives. The reviews will be technical reviews to summarize the deliverables prepared in each task.

2.2.6 Other Support

Task 60 (NUS Task 20) Litigation Support - Litigation support to the Department of Justice will be provided as needed by GCA, NUS, USACE, and EPA.

Task 61 (NUS Task 15) Community Relations - Activities relating to community relations will be conducted on a continuing basis. These activities may include preparation of newsletters and presentations for public hearings.

Task 62 Data Management - Study data collected to date has been entered into the Project Data Management System and the data base will continue to expand as more information is developed.

Task 63 (NUS Task 27) Regulation Assessment - CERCLA and other applicable environmental regulations will be reviewed to ensure that all studies and evaluations are performed in accordance with these regulations.

2.2.7 Other Site Investigations

Task 80 (NUS Task 11) - New Bedford Landfill - A review of work completed to date coupled with information obtained from a preliminary assessment and site inspection will be used to rank the New Bedford Landfill to determine if it qualifies for listing as a separate NPL Site.

Task 81 (NUS Task 14) Undisclosed Sites & Sources - Thirty areas investigated initially have been screened and the results of the screening will be reviewed by EPA's Field Investigation Team to determine if there is a need for further investigation.

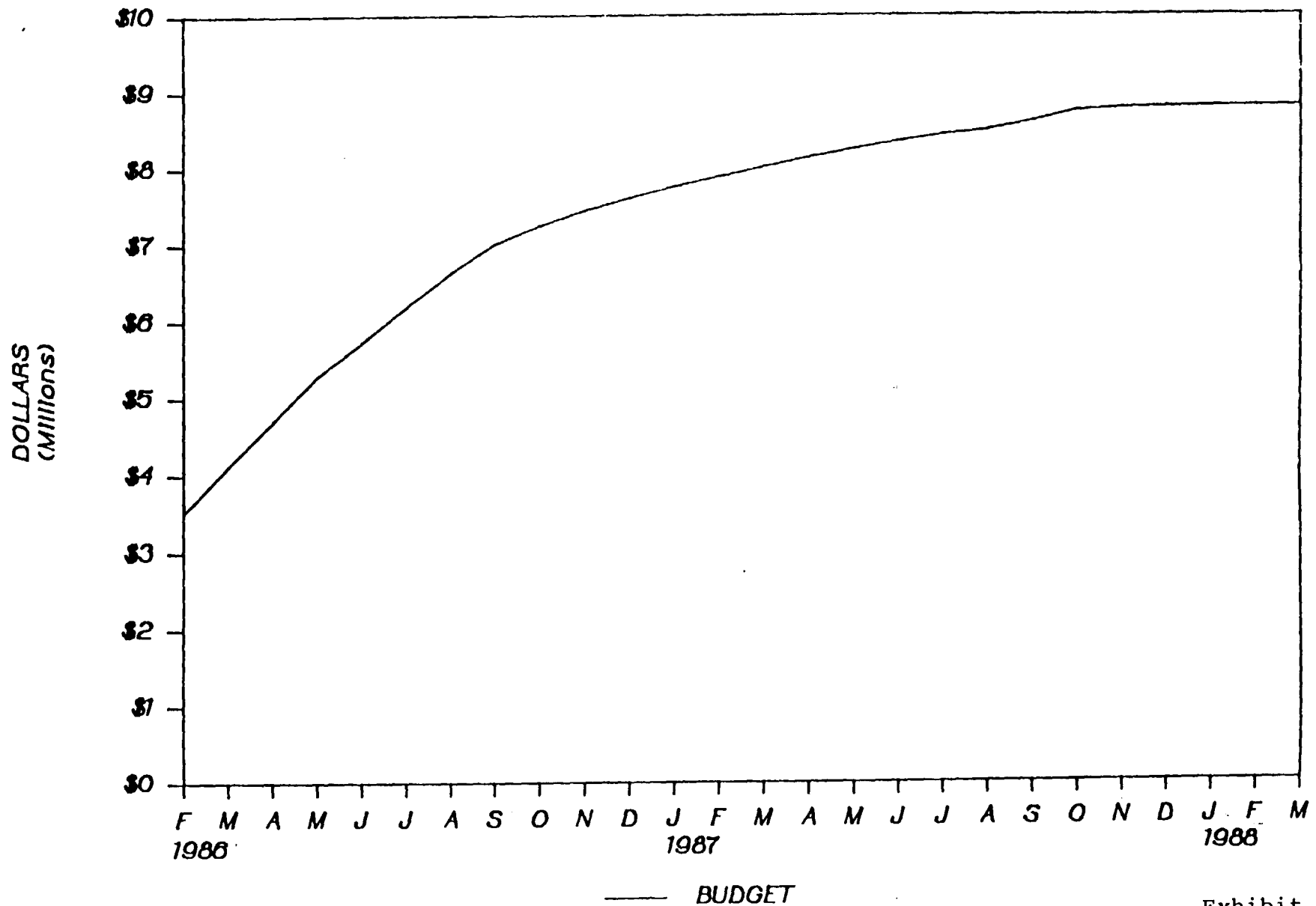
2.3 THE PROJECT BUDGET

The estimated costs for the New Bedford Harbor feasibility study have been input to the Ebasco Progress Measurement System. The costs have been spread over time for each task and by company. The estimated costs are based upon information obtained from EPA Region I, GCA, NUS, and USACE. Costs to complete the Lower Harbor/Bay RI/FS tasks are based on NUS estimates.

The costs to complete the Feasibility Study report will be revised as necessary, when the unassigned tasks in RI/FS Work Plan are scoped and budgeted by Ebasco/E.C. Jordan in May, 1986, under the current Work Assignment.

The estimated costs to complete the feasibility study report have been shown versus time in the following Exhibit 2-5.

NEW BEDFORD HARBOR TOTAL PROJECT



ESTIMATED COSTS TO COMPLETE RI/FS TASKS

March 1, 1986 -
March 7, 1988

Upper Estuary FS - USACE	\$1,606,000
Upper Estuary "Hot Spot" FS - REM III ⁽¹⁾	\$ 250,000
Upper Estuary, Lower Harbor/Bay Endangerment Assessment - GCA	\$ 250,000
Upper Estuary, Lower Harbor/Bay - NUS and REM III	\$3,139,000
Data Management	<u>90,000</u>
	\$5,335,000

Notes

(1) Necessity for a separate FS has not yet been confirmed.

The costs incurred to date, for organizations currently working on New Bedford assignments, are presented in the table below. These costs were provided by EPA Region 1 as reference information.

	Expenditures To Date (as of <u>March 1, 1986)</u>
<u>Upper Estuary</u>	
Draft FS - NUS	\$ 270,000
Support Plus Responsiveness Summary - NUS	\$ 100,000
Upper Estuary FS - USACE	\$ 200,000
<u>Lower Harbor/Bay - NUS</u>	
RI/FS	\$2,800,000
<u>Upper Estuary, Lower Harbor/Bay - GCA</u>	
Endangerment Assessment - GCA	<u>\$ 140,000</u>
TOTAL OF ABOVE COSTS:	\$3,510,000

3.0 MANAGEMENT PLAN

This section of the Project Management Plan describes the procedures and systems that will be used to control the New Bedford Harbor Project. It begins in Section 3.1 with a discussion of the organization. Project responsibility and authority is discussed in Section 3.2. Section 3.3 discusses the project management systems and describes how they will be utilized to control the project schedule and costs.

3.1 PROJECT ORGANIZATION

Exhibit 3-1 shows the organization chart for the New Bedford Harbor Project. The chart shows the organizations that are participating in the Project and provides both the direction and coordination arrangements. The primary organizations and their general responsibilities are given below. Detailed responsibilities are provided in Section 3.2.

USEPA

The U.S. Environmental Protection Agency (EPA) is the Federal Agency responsible for the cleanup of the New Bedford Harbor Superfund Site in New Bedford, Massachusetts, and has executive authority over the planning, cost and schedule control, technical direction, allocation and utilization of all resources authorized for execution of the project. Under the direction of EPA's Waste Management Division Director, project management and technical responsibilities are assigned to the Regional Project Manager (RPM). The RPM has the overall responsibility for the execution of the project and coordinates activities with the Regional Project Officer (RPO) for contractual matters.

The EPA mission encompasses project management activities and technical oversight in order to develop an array of remedial action alternatives to be presented in a Remedial Investigation/Feasibility Study (RI/FS) of the New Bedford Site. EPA will be responsible for selecting a cleanup alternative in a Record of Decision.

United States Army Corps of Engineers (USACE)

The U.S. Army Corps of Engineers through the Missouri River Division (MRD) is responsible under the EPA/USACE Interagency Agreement to provide EPA with technical assistance at Superfund Sites nationwide. The Omaha District is assigned to provide support to EPA Region I through implementation of the Engineering Feasibility Study and overall technical assistance

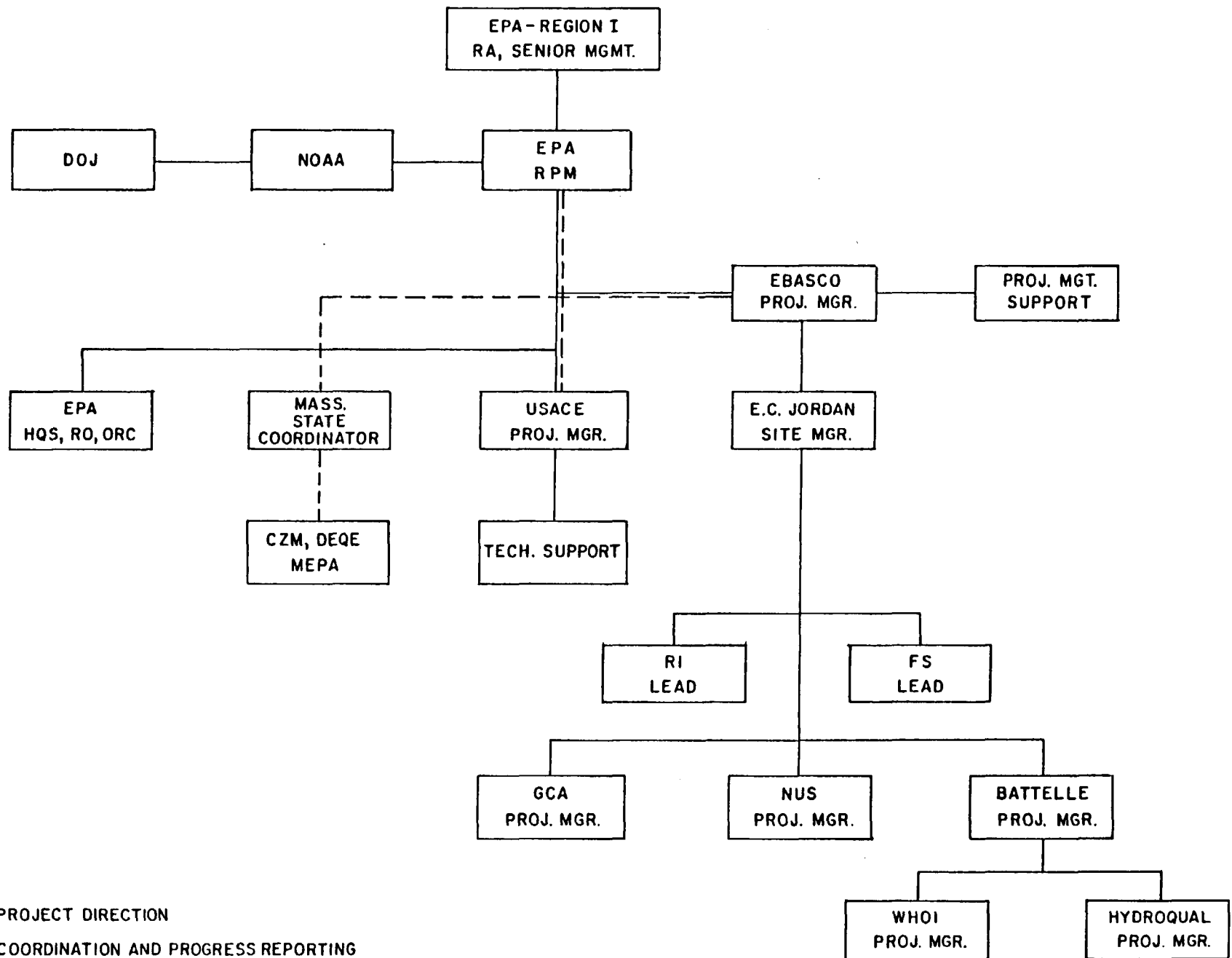


EXHIBIT 3-1
PROJECT MANAGEMENT ORGANIZATION

on the RI/FS, design and construction. Within this framework, MRD will provide the EPA Regional Project Manager with a single point-of-contact responsible for coordination of all USACE activities for the New Bedford Site. Designation of a single contact will streamline the EPA/USACE interface and formalize appropriate lines of communication.

Current Corps work includes: 1. Assistance and review of RI/FS studies and reports; and, 2. Engineering studies to assess proposed dredging and disposal options for engineering feasibility.

Ebasco

Ebasco is supporting EPA Region I under the REM III Contract by providing the Project Manager (PM) for the project as well as PM support.

For the technical studies, E.C. Jordan Co., NUS, GCA, and Battelle will support and perform the tasks necessary to make informed decisions and provide technical depth.

E.C. Jordan Co.

E.C. Jordan Co. (Jordan) is conducting the overall Feasibility Study (FS) for the New Bedford Site under the REM III program. The FS will build on the Draft FS for the Estuary completed by NUS in 1984, and will be coordinated with, and utilize information from, the GCA endangerment assessment, the Battelle hydrodynamic and Hydroqual food-chain models, and the Corps of Engineers' detailed studies of dredging and disposal.

GCA Corporation

GCA is conducting two major tasks for EPA Region I in the New Bedford Project under the TESS Contract: 1. An Endangerment Assessment (EA) to evaluate human health and environmental endangerment; and 2. Development and set-up of a New Bedford Harbor data base management and analysis system. The EA will support ongoing litigation and RI/FS work products as well as providing an analysis of the "no-action" alternative.

NUS Corporation

NUS is supporting EPA Region I under the REM/FIT Contract. Their current project activities fall within two major categories: 1. The feasibility study of the Upper Estuary north of the Coggeshall Street Bridge; and 2. The Remedial Investigation and Feasibility Study for the overall Harbor/Bay. Battelle, Hydroqual, WHOI, and EEEI are subcontractors to NUS under REM/FIT.

The REM/FIT Contract expires in September 1986; prior to that time, Ebasco, NUS and E.C. Jordan Co. will have completed the transition from REM/FIT to REM III such that the schedule and technical continuity will be maintained. This continuity will be maintained by having NUS personnel continue to lead and conduct those tasks which are underway and will be completed by September 1986, and to remain intimately involved in the follow-on work under the REM III Contract. The work remaining after September 1986 being done by Battelle, Hydroqual and WHOI will be placed under contract to Ebasco. The EEEI work will be completed under REM/FIT.

Battelle

Battelle is performing laboratory analysis of samples collected within the Lower Harbor and Bay to evaluate PCB content. Others are analyzing samples for various physical properties and EPA Hazardous Substance List elements and compounds. In addition to using the data above, a Hydrodynamic Model and Food-Chain Model will be produced. Battelle (Hydrodynamic) and Hydroqual (Food-Chain) are currently working on the development, calibration and verification of models to assess the distribution, transport, and fate of PCBs in the upper Estuary and Lower Harbor. These models will be used to evaluate the effects of remedial action alternatives on PCB levels and distribution.

Other Organizations

The other organizations participating in the project include:

- EPA Headquarters (HQ), Regional Office (RO) and Office of Regional Council (ORC) Personnel
- The Department of Justice (DOJ)
- Various Massachusetts State groups including:
 - o Office of Coastal Zone Management (CZM)
 - o Department of Environmental Quality Engineering (DEQE)
 - o Executive Office of Environmental Affairs (MEPA)

The titles used for the lead personnel in this Management Plan are:

Overall Project: EPA Region I Regional Project Manager (RPM)
Regional Project Officer (RPO)
Headquarters Contracting Officer (CO)
Ebasco Project Manager (PM)
E.C. Jordan Site Manager (SM)
GCA: GCA Project Manager (GCA PM)
USACE: USACE Project Manager (USACE PM)
MA: Massachusetts State Coordinator
(STATE COORD)

The persons responsible for individual tasks are designated as Task Leaders (TL).

3.2 PROJECT RESPONSIBILITY AND AUTHORITY

Exhibit 3-2 shows monitoring, control and administration responsibilities for the major positions and organizations in implementing project activities. The responsibilities for the EPA, USACE and Ebasco PM are delineated in more detail below.

EPA

The EPA RPM has overall responsibility for the entire project. Many of the project activities are carried out by the USACE or Ebasco, as discussed in the sections that follow. The key EPA responsibilities are:

EXHIBIT 3-2

RESPONSIBILITY MATRIX (RI/FS and ROD Processes)

		POSITION									
		<u>EPA RPM</u>	<u>EBASCO PM</u>	<u>USACE PM</u>	<u>STATE COORD</u>	<u>DOJ ORC</u>	<u>CONTRACTORS</u>	<u>EPA/HQ OERR</u>	<u>OWPE</u>	<u>EPA RPO</u>	<u>EPA CO</u>
	<u>TASKS</u>										
M O N I T O R I N G	BIWEEKLY PROGRESS REPORTS	CC	A	I			IP	CC			
	MONTHLY PROGRESS REPORTS	CC	A	I	CC	CC	IP	CC	CC	CC	
	PROJECT MEETINGS	P/I	P/I	P/I	P/S	S	I	S	S		
C O N T R O L S	IN SCOPE: TECHNICAL SCOPE	CC	A(all but USACE submittals)	IP			IP	CC		CC	CC
	SCHEDULING BUDGETS	A (USACE submittals)	R (USACE submittals)								
	OUT OF SCOPE: TECHNICAL SCOPE	A	IP R (USACE submittals)	S			IP			A	A
	SCHEDULING BUDGETS										
	RI/FS REPORTS	A	IP	R	R		IP/R	R	R		
	TECH REPORTS	A	IP	R	R	R	IP/R	R			

EXHIBIT 3-2 (Cont'd)

RESPONSIBILITY MATRIX (RI/FS and ROD Processes)

		POSITION								
		EPA RPM	EBASCO PM	USACE PM	STATE COORD	DOJ ORC	CONTRACTORS	EPA/HQ OERR OWPE	EPA RPO	EPA CO
<u>TASKS</u>										
M A D M I N I S T R I O N	SUB- CONTRACTING									
	REM III USACE	CC A	IP R	IP	A		A	CC	CC CC	A
	REM III WORK ASSIG'T AMM'S	A	IP				CC	CC	A	A
	RECORD OF DECISION	A	IP	I	I/A	I/A	I	A		
	STATE COOP AGM'T	A	CC		P					
	I A G AMENDMENT	A	CC	A					A	

LEGEND:

P=Primary Responsibility to conduct

IP=Input and Preparation

I=Provide Information

CC=Information Copies

A=Approval

S=Secondary Responsibility

R=Review

(1) Project Planning

- a. Direct the efforts of all ongoing tasks and identify the additional tasks necessary to meet the project objective.
- b. Maintain project schedule, budget and ensure the technical quality of all work products.
- c. Execute the approved project, acting as the government's project manager.

(2) Monitoring

- a. Oversee bi-weekly and monthly status reporting.
- b. Initiate progress meetings.
- c. Update Project Plan at completion of key milestones (i.e., completion of RI/FS, ROD, Design and Construction Phases) or if significant project changes are made.

(3) Control

- a. Schedule: Approve schedule changes that move the dates of key project milestones.
- b. Cost: Approve budget increases and approve changes in project scope which may increase project budget.
- c. Allocate these project funds to contract services and to other state or Federal agencies as may be required.
- d. Adjust and reallocate funds among ongoing project activities as necessary to ensure efficient funds utilization.
- e. Technical: Ensure technical quality of all work products.
- f. Identify key strategy points.

(4) Technical

- a. Approve all RI and FS reports.
- b. Approve all other technical reports, criteria and designs prior to follow-on use.

- c. Fund and utilize other Army expertise to conduct specialized activities such as construction techniques and removal, chemical or biological agent removal, research and development, etc.

(5) Administrative

- a. Approve REM and USACE subcontracts if the subcontract is outside the approved scope and budget for that task.
- b. Prepare and process work assignment amendments, forwarding these amendments to EPA Region I's Regional Project Officer.
- c. Provide real estate assistance as appropriate for the negotiation and execution (for the government) of all necessary real estate access agreements and other necessary legal documents.
- d. Be responsible for obtaining funds to support the tasks assigned to the USACE, Omaha District and to the contractors.
- e. Maintain project files including site data and contractual information.
- f. Be responsible for the development of the Record of Decision (ROD) and briefing upper management as necessary to obtain appropriate agency review and concurrence.

6. Coordination

- a. Coordinate internally with EPA Region I program offices, EPA Headquarters and Office of Regional Counsel and distribution of monthly progress reports as necessary.
- b. Provide state coordination including transmittal of progress reports, state input, review and involvement with community relations.
- c. Coordinate with DOJ and NOAA.
- d. Coordinate and access technical expertise from EPA's national organization and DOJ's experts.

- e. Coordinate with Region I's community relations office, assist in the planning and implementation of public meetings, fact sheets and public comment periods.
- f. Coordinate with elected officials.
- g. Ensure consistency with EPA's policies and regulations, notably compliance with other statutes.

(7) Communication

- a. Maintain open lines of communication between members of the project study team.
- b. Support CERCIS (CERCLA Informational System).
- c. Maintain communication with other Region RPMs, program offices, the state and elected officials.
- d. Report directly to the Division Director.

(8) Enforcement

- a. Support development of Notice Letters
- b. Support PRP searches.
- c. Provide technical expertise to litigation team and generally support litigation needs.
- d. Participate in negotiations.

USACE

The Omaha District will be responsible for the following:

- (1) Coordinate execution of all studies, field or laboratory, assigned to the USACE. This includes:
 - a. Development of scope, schedule and budget for new assignments.
 - b. Coordination of assigned studies with emphasis on schedule and budget.
 - c. Provide single point-of-contact to EPA RPM.
 - d. Status information input to Ebasco PM.

- (2) Funds Control: Track expenditures of funding provided to USACE. Approve budget increases of \$10,000 or less for approved activities. Obtain EPA RPM approval of budget increases greater than \$10,000.
- (3) Obligations: Identify funding needs far enough before obligation is needed to assure continuity of operations.
- (4) Schedule: Identify any schedule slippage which could impact milestone dates and recommend or delay recovery actions. Manage activities in such a manner that any delays are minimized.
- (5) Coordination: Coordinate distribution and review of reports generated by the USACE. Assure acceptability of reports to EPA RPM.
- (6) Resolve Issues: Elevate policy questions to higher authority as necessary to assure resolution in a timely manner.
- (7) Litigation Support: Recognize litigation needs when planning and executing studies. Provide additional support/testimony when specifically requested by EPA RPM.

Ebasco

The Ebasco PM will:

- (1) Approve the issuance of bi-weekly and monthly progress reports.
- (2) Approve changes to the technical scope, schedule and budget which are within the overall scope of the project for the organizations under his direct control.
- (3) Recommend changes to the EPA RPM for those items outside of the overall scope of the project.
- (4) Coordinate the Ebasco and EPA review and approval of technical reports.
- (5) Recommend and arrange for expertise required to meet various complexities of the project.
- (6) Coordinate and direct special assignments related to overall project management as requested by the EPA RPM.

3.3 PROJECT MANAGEMENT AND CONTROL

The New Bedford Project will be managed using a two-phased management approach which consists of:

- o Baseline planning, which entails an initial project task description, schedule and budget, where the work effort is broken down into clearly defined, manageable tasks, and;
- o Management by exception, in which project progress is monitored using Ebasco's computerized management control and tracking systems. These systems highlight variances with the baseline plan and allow managers to anticipate schedule or budget problems and take timely action to prevent delays or budget overruns.

Ebasco's management control system is a "real time" system. It allows managers to foresee problems, rather than documenting problems that are past the point where management action is effective.

This section describes the management and control approach and the management reports and accounting system that support the management plan. These procedures and systems will be utilized by Ebasco to provide tracking information and corrective action recommendations to the Project Manager.

3.3.1 Management and Control

3.3.1.1 Task Initiation

Many major RI/FS tasks for the New Bedford Project are underway. For unassigned RI/FS tasks, remedial action design through remedial action construction the following process for task initiation would be followed. The discussion assumes that base funding is in place for the REM III contract, the GCA contract, and the Interagency Agreement for the U.S. Corps of Engineers. It is also assumed that the process would start with issuance of a work assignment (WA) to Ebasco or a similar contractor.

The significant contractor task, after acknowledging receipt of the work assignment, is to prepare a Work Plan which includes the technical approach, schedule and budget for the work assignment.

The key management and control elements of these work assignments include: Baseline planning including technical, schedule and budget aspects and monitoring of progress. These elements are described in detail below.

3.3.1.2 Baseline Planning

The baseline planning for each WA includes preparation of the technical work plan, the schedule, and the budget. The important elements of the Work Plan include a statement of the problem, a statement of the objectives of the work assignment, and a task plan for the work.

The technical work effort will be broken down into discrete tasks. These tasks will be scheduled, budgeted, and tracked separately during the course of the work. The detailed technical approach will include a discussion of anticipated problems and proposed solutions. Decision points will be established in the schedule to provide an opportunity for redirection of the remaining work, should the data indicate the need.

The tasks will be scheduled based on the site information available and the objectives for the WA. The Ebasco Scheduling System (ESS) will be used to formulate the schedule, which will then be coded and entered into the computer system. Key schedule milestones will also be identified. The current schedules for New Bedford are given in Section 2 of this Project Management Plan. The critical path through the network is shown, as well as the key milestones to be monitored.

Each task will have assigned resources, to include LOE hours by labor category for REM III work and dollars for USACE and subcontractor work. The current resource information for New Bedford is given in Section 2 of this Project Plan. The resources will be loaded into the Engineering Progress Measurement System (EPMS), converted from hours to dollars in EPMS, where required, and added to the subcontracting and other direct costs.

EPMS output is available both in hours and dollars at the task, or higher summary level. The data are available in both monthly and cumulative format. A curve showing the cost as a function of time for a typical task is shown on Exhibit 3-3. Shown on this exhibit is the baseline cost estimate as well as hypothetical actual cost and Earned Value curves. The usefulness of Earned Value techniques to monitor cost and schedule performance is discussed in the following section.

Exhibit 3-4 shows the interrelationship between schedule (ESS) and resources (EPMS). As indicated on the exhibit, the resources are spread over the schedule duration for each task. A change in either the task duration or schedule automatically realigns the resources, allowing revised total numbers to be generated. Therefore, managers can run various schedule scenarios and develop resource curves, which can be used for manpower planning.

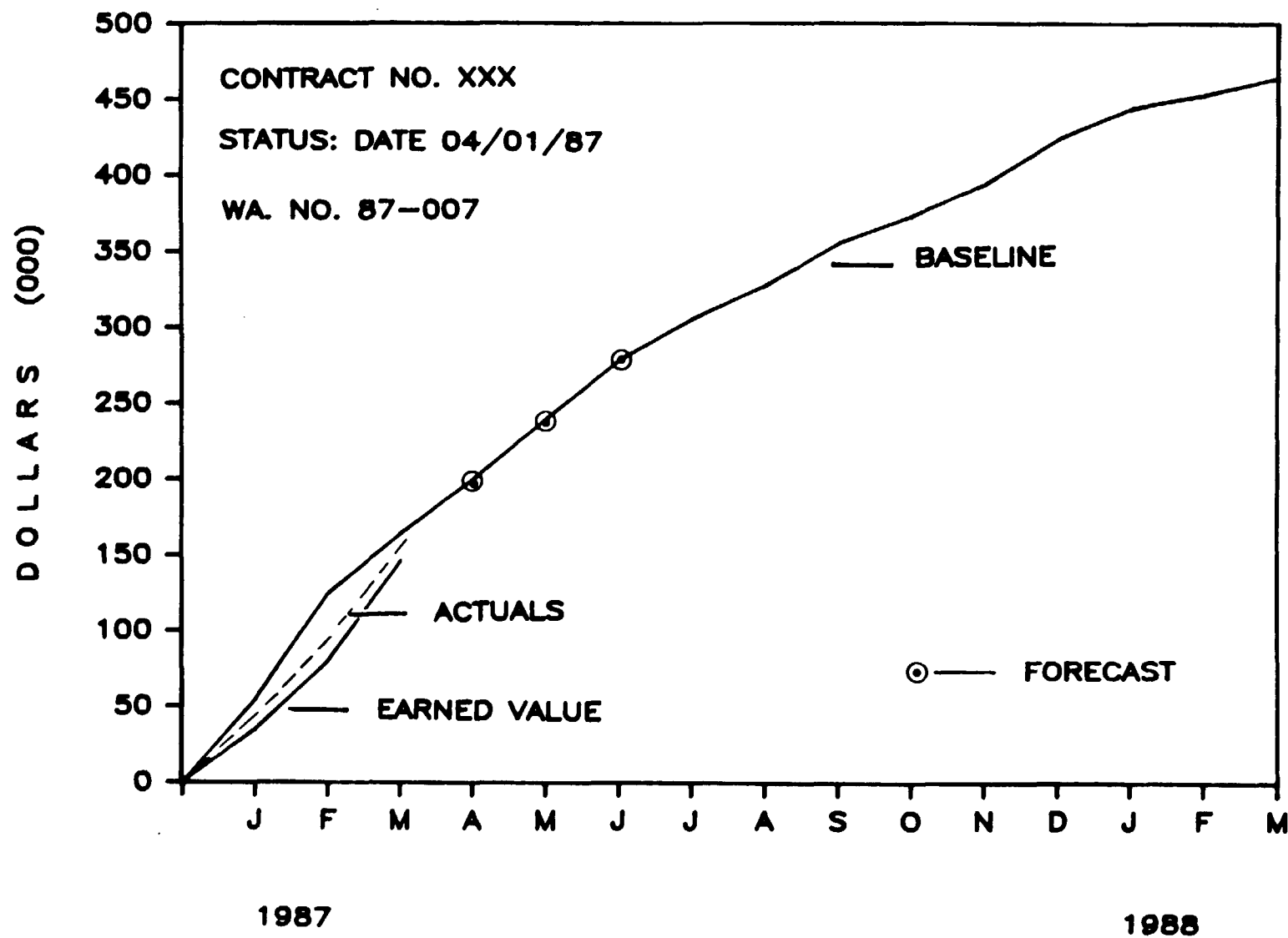
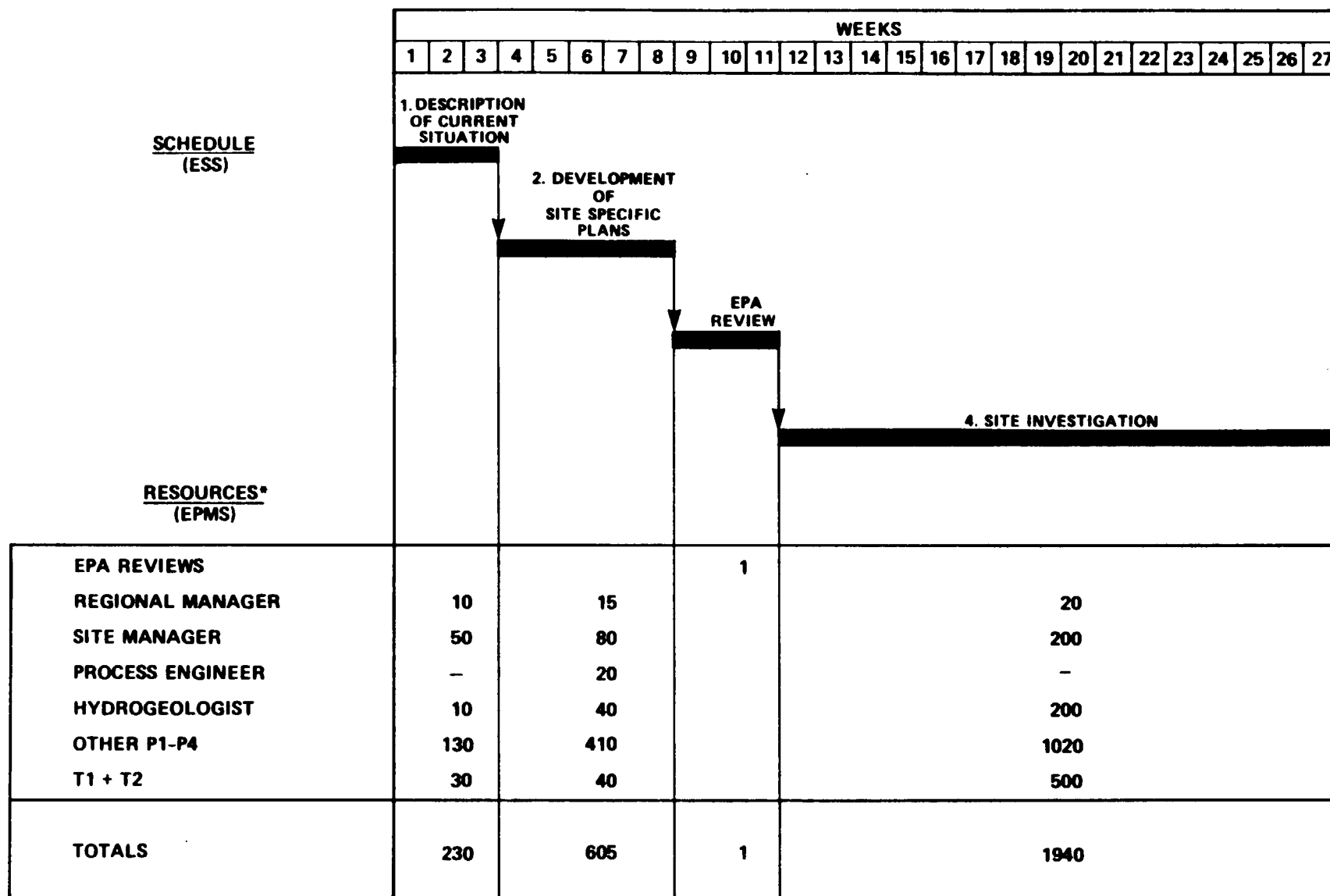


EXHIBIT 3-3
COST FLOW FOR A TYPICAL WORK ASSIGNMENT



*ALL IN HOURS EXCEPT FOR EPA REVIEWS.

EXHIBIT 3-4
RELATIONSHIP OF ESS TO EPMS

3.3.1.3 Monitoring of Progress and Technical Quality

The primary responsibility for execution of the work assignment rests with the Task Leader, who will monitor work progress. However, all aspects of the Project, including technical, schedule, and cost, will also be monitored by the management team and reports provided to all participants on the project. These management reports are fundamental tools for Ebasco's management by exception approach. The reports will emphasize technical problems, schedule slippages and cost variances. These concerns are highlighted along with the action plans for resolution and the parties responsible to resolve the concerns.

All technical deliverables produced in executing the project will be provided to the responsible Project Manager who, in concert with technical specialists, will review them and return comments to the originator for resolution. After the review is complete and approval is obtained from the overall Project Manager, final drafts will be issued. Meetings and telecons will be used to discuss the deliverables and resolve comments.

An important element in monitoring technical and schedule problems will be their entry into the Action Tracking System (ATS) and monitoring by the various levels of management. ATS monitors technical problems, project milestones, and other events and will be used in all phases of the project. A sample page of ATS output for New Bedford is shown on Exhibit 3-5.

In addition to the milestones monitored in ATS, the schedule system will forecast new schedule dates based on progress to date. This will allow anticipated schedule slippages to be defined and brought to management's attention before a milestone date is missed. Responsible groups will be requested to make recommendations for schedule control for management's review and approval.

The cost status will be monitored on a task basis. Earned Value techniques will be used for cost monitoring. Their primary value is to calculate realistic estimates of the cost to complete tasks and upon summation of all task data, the cost to complete the project. For example, Exhibit 3-3 shows baseline budget, actual and Earned Value curves for a hypothetical example built around a typical WA. In this case, the actual cost is less than the baseline cost so there is an acceptable spending rate for the WA. However, the Earned Value is less than the actual cost, which indicates that it is costing more hours or direct costs to achieve results than predicted and that the effort is behind schedule. If this situation were to continue, the costs would exceed the baseline and the schedule end dates would not be met.

PAGE: 1

SORTED BY: ATS ID / ACTION ID

EBASCO SERVICES INCORPORATED
REM III PROGRAM-ACTION TRACKING SYSTEM

STATUS AS OF: 05/31/86

RUN DATE : 06/06/86

ITEM-ID	MAJOR TITLE	KEY FLG	SCHED XPCTD ACTUAL	WA NO. WCN TASK NO.	REG# SITE# ACT-ID	DESCRIPTION / STATUS / COMMENTS	SCHED EXPCTD ACTUAL	RESP PERSON COMPANY SORT FIELD
NBH-001	AIR STUDY (12)	N	03/31/86 06/15/86		1	SITE NAME : CONTRACTOR: NUS		CORRESPONDENCE #: SORT FIELD:
				01				
				001	N	REPORT WILL BE FINALIZED UPON RECEIPT OF EPA-AIR DIVISION COMMENTS.	03/31/86 06/15/86	J. YEASTED NUS
NBH-002	GROUNDWATER STUDY (13)	N	04/30/86 05/30/86		1	SITE NAME : CONTRACTOR: NUS		CORRESPONDENCE #: SORT FIELD:
				02				
				001	N	DRAFT OF THE GROUNDWATER STUDY REPORT IS NOW COMPLETE AND UNDERGOING FINAL NUS REVIEW.	04/30/86 06/15/86	J. YEASTED NUS
				002	N	EXPECTED DATE FOR TASK COMPLETION SLIPPED DURING THIS PERIOD, BUT WILL NOT IMPACT OVERALL SCHEDULE/BUDGET.		
NBH-003	PHYSICAL TESTING OF SAMPLES	N	09/30/86 09/30/86		1	SITE NAME : CONTRACTOR: NUS		CORRESPONDENCE #: SORT FIELD:
				03				
				001	N	COMPLETION OF PHYSICAL TESTING OF HARBOR SEDIMENTS SAMPLES. EPA IS EVALUATING IF ANALYSES CAN BE DONE BY NED. THIS IS AN ALTERNATIVE TO COMPETITIVE BIDDING FOR ANALYSES.	09/30/86 09/30/86	J. YEASTED NUS
				002	N	DECISION DUE BY 06/15/86.		
NBH-004	DATA VALIDATION (5)	N	09/28/86 07/30/86		1	SITE NAME : CONTRACTOR: NUS		CORRESPONDENCE #: SORT FIELD:
				04				

EXHIBIT 3-5
ATS OUTPUT

If the Earned Value curve were between the actual cost and baseline curves, it would indicate that the WA was under budget but behind schedule. If it were over the baseline curve, it would indicate the WA was under budget and ahead of schedule. This type of information will be provided to all management levels and will allow early warning of unwanted trends and timely corrective action.

The goal of program management is to keep each item of work within the technical, schedule and budget baselines established at the onset of the effort. The information provided by ATS, ESS and EPMS and the awareness of all project personnel of the importance of closely monitoring and controlling their efforts help achieve this goal. However, changes do occur and they cannot always be accommodated within the schedule and budget. Control functions have been designed to recognize this fact, and deal with it through formal work authorization and disciplined change control using the same process that the original Work Plan goes through.

3.4.1.4 Communications

Good communications are essential if the New Bedford Project is to be successfully accomplished. A good communications network assures the passing of essential information, not only between members of a single task team but also between all teams, so that information and experience gained can be shared throughout the project organization. In addition, the system ensures that all necessary information is exchanged between EPA, the Corps and contractors.

A successful interchange of information depends upon both formal and informal communications. As needed throughout the project, Task Leaders will meet with and/or contact the managers by telephone for the purposes of scheduling, information gathering and dissemination, and problem resolution. Unexpected issues of a serious nature are telephoned to the responsible PM immediately. Conversations of significance are documented by written memorandum.

All communications described above will be documented and retained in a file for the entire contract filed by task.

The ability to identify and prevent or resolve project implementation problems is indispensable to successful performance. The key to preventing and resolving problems is careful advanced planning and close communications between management and technical personnel in both client and contractor organizations.

Problems will be anticipated and prevented by:

- o identifying possible problems having a high probability of occurrence or a potentially significant negative impact on performance (i.e., quality of services performed, schedules, costs);
- o identifying events, observations or other signals that could be indicative of the development of a given problem;
- o identifying the organizational level most likely to recognize a developing problem and the level that will have the authority to react to the problem;
- o developing contingency plans (for avoiding or reducing the impact of a problem) that preferably can be implemented at the same organizational level at which the problem is recognized; and
- o communicating the information generated in the preceding steps to appropriate staff.

Regularly scheduled meetings will include:

- o Monthly Project Review Meeting. This meeting will rotate between the active offices and be attended by the PM, organization PMs, selected Task Leaders and selected other staff. It will be held on a monthly basis and will cover the following agenda:
 - Overall Project Status (Technical, Schedule, Budget) compared to Work Plan,
 - Key Items of Interest (problems/solutions), and
 - Staffing.
- o Quarterly Senior Management Meeting. This meeting will be held in EPA's Region I office and will be attended by the Project Manager, organization PMs and Senior EPA and USACE personnel. It will cover the following agenda:
 - Overall Program Status Compared to Plan, and
 - Key Items of Interest

3.3.2 Management Reports and Information Systems

3.3.2.1 Overall Plan

The objectives of the management reporting and information systems are to support the program management and control functions through timely and accurate reporting in all phases of the program.

A significant feature of the management information systems and accounting systems are their capability to track project cost/schedule and control activity for multiple subcontractors, as well as for Ebasco's activities. Of particular significance from a management reporting standpoint is the ease and flexibility with which levels of reporting, e.g., details and summary, can be varied. For example, the Task Leaders will be provided cost and schedule reports which will be broken down to the task level. The Project Manager will be provided reports summarized at the major task level.

3.3.2.2 System Description

The specific management information and accounting systems to be used are:

- o Planning, Scheduling and Monitoring Systems,
 - Ebasco Scheduling System (ESS)
 - Engineering Progress Measurement System (EPMS)
- o Management Information and Decision Support Systems,
 - Action Tracking System (ATS)
 - Progress Reporting

Planning, Scheduling and Monitoring Systems

The Ebasco Scheduling System (ESS) is designed to provide program management with information to effectively fulfill planning, scheduling and program control needs. ESS employs a Critical Path Method (CPM) technique to analyze logic and calculate dates for all activities in the project network. The primary objectives of ESS include the ability to:

- o Develop realistic project schedules based on sound logic, milestone commitments, and available resources,
- o Generate alternative schedules for management to make strategy decisions based on factors such as EPA requests, and recovery from delays, and

- o Offer priority schedule guidance for participating groups to develop "work-around" plans when in danger of not meeting milestone commitments, such as when laboratory data is late.

All levels of management will be intimately involved with development and maintenance of the schedule through ESS. The ESS is fully integrated with the Engineering Progress Measurement System (EPMS).

The cost/schedule control system to be utilized is derived from the Ebasco Engineering Progress Measurement System (EPMS). EPMS utilizes the concept of Earned Value, which integrates the project schedule with costs by task to provide objective measurement and reporting of project progress. This system will provide all data required as well as additional information that will assist in closely tracking and controlling project costs. This additional information consists of the Earned Value of the work performed, which can be compared to the cost expended and schedule progress. This system allows management to identify and respond rapidly to unfavorable trends, before significant overruns or slippages have occurred. It also provides accurate forecasts of cost to completion.

EPMS reports at the task level are discussed in Section 2.0. Similar reports will be consolidated at the major task organization and project level. This feature allows the tailoring of reports to the appropriate management level.

Management Information and Decision Support Systems

The Action Tracking System (ATS) will contain specific problems or important milestones such as deliverable schedules and activity completion dates along with the required actions, status, responsible party and commitment date. The system will tie the program together basically in "real time," and will provide high visibility of problems and enhance their rapid resolution. It will be used by managers primarily to track the resolution of technical problems and corrective actions required to resolve cost or schedule variances. It also will be used to track commitments made or actions required by letters or telecons between the parties or by agreements made in meetings. Certain critical items on the list will be flagged as Key Items,

which allows them to be sorted and provided to the appropriate management levels. A sample page of ATS output was shown in Exhibit 3-5. ATS report updates will be produced by the 15th and the last day of each month. Team members will provide status updates of ATS at these points to the REM III PM. Reports are produced and distributed by the following Thursday to Task leaders and managers who will get copies of all tasks for which they are responsible.

Monthly Progress Reports. Schedule status (ESS) updates and progress report text will be provided to the REM III PM on the last working day of the month. Cost data will be provided to him by the USACE, NUS REM/FIT and GCA by the fifth working day of the following month. Cost data will be provided on the weekly time sheets utilized on REM III for all REM III participants. The monthly progress report will be issued by the middle of the following month. Its format is given in Exhibit 3-6.

EXHIBIT 3-6

MONTHLY PROGRESS REPORT FORMAT

1. Executive Summary
2. Overall Project Progress (Technical Progress, Schedule Progress, and Milestones, Deliverables, Activities Completed)
 - o Remedial Investigation
 - o Feasibility Studies
 - o Project Management
 - o Other Support
 - o Other Sources and Sites
3. Status of Budgets, Agreements and Contracts
 - o U.S. Army Corps of Engineers
 - o GCA
 - o REM-FIT
 - o REM-III
4. Meetings, Reports and Upcoming Reviews

GLOSSARY OF TERMS

Activity:	A defined subdivision of work to be done under a specific task.
ATS:	Action Tracking System
EPMS:	Engineering Progress Measurement System
ESS:	Ebasco Scheduling System
Hot Spot:	An area where the concentration of contaminants is significantly higher than in the surrounding area in the Upper Estuary.
QA:	Quality assurance
PCB:	Polychlorinated Biphenyls; includes all related components which contain varying percentages of chlorine.
PRP:	Potential Responsible Party
REM:	Remedial Engineering Management
REM-FIT:	Remedial Engineering Management, Field Investigation Team
RPM:	Regional Project Manager; the EPA individual responsible for a specific project.
Task:	A defined subdivision of project work which may contain a number of related activities.
Upper Estuary:	That part of the Acushnet River Estuary above the Coggeshall Street Bridge.

Governmental Organizations

CDC:	Center for Disease Control
DEQE:	(Massachusetts) Department of Environmental Quality Engineering
DOJ:	Department of Justice
EPA:	Environmental Protection Agency

FDA: Food and Drug Administration
MRD: Missouri River Division, USACE
NED: New England Division, USACE
NIOSH: National Institute of Occupational Safety and Health
NOAA: National Oceanic and Atmospheric Administration
USACE: U.S. Army, Corps of Engineers
WES: Waterways Experiment Station, USACE